

Notice of Allowability

Application No.

09/630,572

Examiner

Charlotte M. Baker

Applicant(s)

YOSHIDA, HIROKI

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Appeal Brief filed on 12/08/2006.
2. ☒ The allowed claim(s) is/are 1-9 and 11.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

KAW Williams

KIMBERLY WILLIAMS
PRIMARY PATENT EXAMINER

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
2. Authorization for this examiner's amendment was given in a telephone correspondence with Cameron K. Weiffenbach (44,488) on March 13, 2007.
3. The application has been amended as follows:

All of the claims have been replaced with the following:

Claim 1: An image processing apparatus, comprising:

edge detecting means for determining the presence/absence of an edge ~~at each pixel~~
between a target pixel and pixels nearest to said target pixel of input data and detecting a position
of the edge ~~at each edge pixel~~ of each target pixel;

selecting means for selecting a weighting matrix corresponding to the position of the
edge of each target pixel determined to have an edge by said edge detecting means;

enhancement range determining means for determining, using said weighting matrix, a
range of edge enhancement of each said target pixel determined to have an edge; and

edge enhancing means for executing an edge enhancement process on data of object
pixels within the enhancement range determined by said enhancement range determining means.

Claim 2: An image processing apparatus according to claim 1, wherein said
enhancement range determining means increases the weighting of components corresponding to
the interior side of the edge in the weighting matrix.

Claim 3: An image processing apparatus according to claim 1, wherein said edge detecting means determines the edge to be between pixels.

Claim 4: An image processing apparatus according to claim 1, wherein said selecting means selects the weighting matrix based on the presence/absence of an edge in four directions surrounding the target pixel.

Claim 5: An image processing apparatus according to claim 1, wherein said edge enhancing means executes processing based on the hue and chroma of the pixels surrounding the object pixel.

Claim 6: An image processing apparatus according to claim 1, wherein said edge enhancing means executes processing based on the distance of the object pixel to the target pixel.

Claim 7: An image processing method, comprising the steps of:
determining the presence/absence of an edge ~~at each pixel~~ between a target pixel and pixels nearest to said target pixel of input image data;
detecting a position of the edge of each target pixel;
selecting a weighting matrix corresponding to the position of the edge for each target pixel determined to have an edge, said position being between a target pixel and pixels nearest to said target pixel;
determining, using said weighting matrix, a range of edge enhancement for each said target pixel determined to have an edge; and
executing an edge enhancement process for the object pixels within the determined edge enhancement range.

Claim 8: An image processing method according to claim 7, wherein the weighting of components corresponding to the interior side of the edge in the weighting matrix is increased in the step of determining the range.

Claim 9: A ~~computer readable medium storing a computer program~~ medium readable by a computer storing computer-executable programs comprising the steps of:

determining the presence/absence of an edge ~~at each pixel~~ between a target pixel and pixels nearest to said target pixel of input image data;

detecting a position of the edge of each target pixel;

selecting a weighting matrix corresponding to the position of the edge for each target pixel determined to have an edge;

determining, using said weighting matrix, a range of edge enhancement for each said target pixel determined to have an edge; and

executing an edge enhancement process for the object pixels within the determined edge enhancement range.

Claim 10 (canceled).

Claim 11: An image processing apparatus, comprising:

an edge detector for determining the presence/absence of an edge ~~at each pixel~~ between a target pixel and pixels nearest to said target pixel of input data and detecting a position of the edge ~~at each edge pixel~~ of each target pixel;

a selector for selecting a weighting matrix corresponding to the position of the edge of each target pixel determined to have an edge by said edge detecting means; and

a controller configured to determine, using said weighting matrix, the range of edge enhancement of each said target pixel determined to have an edge;

said controller further configured to execute an edge enhancement process on data of object pixels within the enhancement range determined by said enhancement range determining means.

4. Authorization for this examiner's amendment was given in a telephone correspondence with Cameron K. Weiffenbach (44,488) on April 02, 2007.

The Abstract has been replaced with the following:

The sharpness of a digital image is enhanced by an edge enhancement process in which the edge adjustment range is adjusted. The image processing apparatus of the present invention determines the edge enhancement range by calculation using a weighting matrix. Specifically, data of a target pixel and the surrounding pixels are calculated using a weighting matrix selected by a weighting selection means, and the edge enhancement range is determined by comparing this calculated value to a specific threshold value. The data of pixels within the enhancement range are then subjected to the edge enhancement process.

Allowable Subject Matter

5. Claims 1-9 and 11 are allowed.
6. The following is an examiner's statement of reasons for allowance: the prior art of record does not teach the claimed subject matter of claims 1, 7 and 11; therefore, claims 1, 7 and 11 are allowable due to an agreement reached between the Examiner and the Applicant to amend the claims as stated in the Examiner's Amendment and Applicant's "Argument" section of the Appeal Brief dated 12/08/2006.
7. It follows that claims 2-6 and 8-9 are then inherently allowable for depending on an allowable base claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charlotte M. Baker whose telephone number is 571-272-7459.

The examiner can normally be reached on Monday-Friday 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


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